2017

U.S. DEPARTMENT OF ENERGY
SOLAR DECATHLON

U.S. Department of Energy Solar Decathlon 2017
Event Talking Points

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About Solar Decathlon

The U.S. Department of Energy Solar Decathlon is a collegiate competition of 10 contests that challenge student teams to design and build full-size, solar-powered houses. The winner of the competition is the team that best blends design excellence and smart energy production with innovation, market potential, and energy and water efficiency. Open free to the public, October 5–9 and 12–15, 2017 at the 61st & Peña commuter rail station on the University of Colorado A line near Denver International Airport in Colorado, the event also features a sustainability expo, professional and consumer educational workshops, and middle school education events.

See the Solar Decathlon website, Plan Your Visit section, especially the Things to Do page for more information, schedules, locations, special events, workshops list, and more. The Visitor Guide also contains similar information.

Solar Decathlon is more than a competition. It provides a hands-on experience and unique training that prepares the competing students to enter the clean energy workforce. It is also an intensive learning experience for consumers and homeowners as they experience the latest technologies and materials in energy-efficient design, clean energy technologies, smart home solutions, water conservation measures, electric vehicles, and sustainable buildings.

History:

- The first U.S. Department of Energy Solar Decathlon was held in 2002 in Washington, D.C.
- The competition then occurred biennially in 2005, 2007, 2009, and 2011 in Washington, D.C.
- In 2013 and 2015, the Solar Decathlon moved to Irvine, California.
- Solar Decathlon 2017 is being held for the first time in Denver, Colorado.
- The next Solar Decathlon in the United States is planned for 2020.
- Solar Decathlon has expanded internationally to five additional continents: Africa, Asia/China, Europe, South America, and the Middle East.

Competition

The 10 contests for Solar Decathlon 2017 are listed in the Visitor Guide and on the website.

Each contest is worth a maximum of 100 points, for a competition total of 1,000 points. Solar Decathlon teams can earn points by:

- Completing tasks that simulate modern living (e.g., cooking, doing laundry, operating electronics, commuting in an electric vehicle)
- Ensuring their houses and appliances perform to specified criteria
- Hosting jury evaluations. Juries are composed of individual jurors at the top of their respective professions. Renowned in their chosen fields of expertise, they bring professional excellence and practical in-the-field expertise to each of the contests they evaluate.

For the first time in 2017, teams are eligible for cash prizes. At the end of the competition, the teams will be ranked according to their net score and will earn prizes as follows:

1st: $300,000
2nd: $225,000
3rd: $150,000
4th: $125,000
5th – and greater: $100,000

How is the 2017 competition different from previous competitions?

Solar Decathlon 2017 is the eighth edition of the competition in the United States. Each edition is slightly different, evolving as industry and market conditions change. Following each competition, DOE evaluates lessons learned, team feedback, and other factors to revise the contests and rules for the following competition. With varying levels of emphases, Solar Decathlons have included contests that challenge collegiate teams to address:

- Architectural and engineering design, and building science
- Energy efficiency through contests such as Appliances, Home Entertainment, Lighting, and Hot Water
- Home comfort—indoor temperature, humidity, and air quality—through the Comfort Zone or Health and Comfort contests
- Transportation with an electric vehicle, sometimes through a dedicated Getting Around or Commuting contest, or wrapped into another contest such as Home Life
- Energy production using solar energy systems. These were stand alone in the early years of the competition, but became grid tied beginning in 2009. Like the Energy Balance contests of the past, the 2017 Energy contest evaluates the teams' abilities to achieve a net energy consumption of zero during the competition by generating as much electricity from solar as they use. New for 2017, is the "energy value" component of the contest, which is designed to mimic the arrangement a consumer

with a solar-powered house may have with a utility, including a net-metering agreement and time-of-use electricity rates. Time-of-use rates are typically based on the idea that electricity is in greater demand, and thus more expensive, during the times of day that temperatures are highest and most people are awake and at home using significant electricity.

- Also new for Solar Decathlon 2017 is the Water Contest, which rewards smart water solutions. Always ahead of their time, past Solar Decathlon teams have consistently integrated water use and reuse strategies into their designs, even though no points were awarded for this effort. This new contest is important not only because water is a precious resource (particularly in Denver and the Western United States), but also because water and energy are inextricably linked—it takes water to make the energy we use, and it takes energy to treat and deliver the clean water we require. Criteria for the Water Contest include water conservation, reclamation and reuse, and considerations of water use in landscape design.

Solar Decathlon 2017 Teams

The 11 teams include four returning teams and seven new teams. Each team listing includes the team name, followed by the list of schools on the team (and any school location that isn't already indicated in the school name).

Prior to September 2017, when the team from Washington State University withdrew from the competition, there were 12 teams competing in Solar Decathlon 2017. A description of the Washington State project is included in these talking points, but they will not have a competition house at the event.

Las Vegas: University of Nevada, Las Vegas (Las Vegas, Nevada)

Because the *Sinatra Living* house is targeted for aging-in-place residents, the students from the University of Nevada, Las Vegas team held several meetings, including an AARP focus group, and used virtual reality and board displays to walk people representing their target market through the house and obtain feedback on design and accessibility features. An open layout, adjustable countertops and shelves, slip-resistant flooring, and fall detection sensors make the house safe and comfortable for any resident with mobility, visual, or cognitive impairments.

Target homeowner: The house is designed for middle-class Nevada residents approximately 45 – 65 years of age who do not have a restricted income. The goal is to ease the transition for a middle-aged worker, who may shift to a restricted income, into retirement with the ability to live independently.

Technological innovations and unique features:

- The modular solar thermal powerhouse uses evacuated tube solar collectors to heat water for both domestic use and radiant floor heating.
- An open floor plan, adjustable countertops and shelves, and slip-resistant flooring make the house safe and comfortable for aging individuals, including those with mobility, visual, and cognitive impairments.
- A fall detection and alert system which could facilitate emergency response by alerting caregivers and unlocking doors automatically

- A home automation application with Amazon Alexa integration connects occupants with security, heating and cooling, lighting control, and more, both at home and away.

Team online presence:
Website: http://unlvsd.com/
FB: https://www.facebook.com/UNLVSD17/
Twitter: https://twitter.com/unlvsd17
Instagram: https://www.instagram.com/unlvsd17/

Past houses:
https://www.solardecathlon.gov/past/2013/team_lasvegas.html

Maryland: University of Maryland (College Park, Maryland)

The team from University of Maryland is eager to debut *reACT*, its prototype for sustainable, self-sufficient Native American housing, at this year's Solar Decathlon. Designed for a young couple living in the Denver area who remain registered members of the Nanticoke Indian Tribe, this "kit-of-parts" modular house is designed to improve connections to diverse local ecosystems. It includes systems that capture solar energy and rainwater and turn waste into useful resources. Flanking modules plug into a central mechanical core, which manages the flow of water, air, and energy, and a central courtyard extends the living space and doubles as a solar heat collector. With a composting system, hydroponic garden, vegetable garden, and movable "living walls" covered in plants, *reACT* also demonstrates urban farming—an important facet of self-sufficient living.

Target homeowner: The house was designed for a young married couple that lives in the Denver, Colorado, area and who remain registered members of the Nanticoke Indian Tribe. Like two-thirds of Native Americans, the couple lives in an urban center. *reACT's* design provides the couple a way to live that is ethical and authentic to their culture.

Technological innovations and unique features:

- A mechanical core manages the flow of water, air, and energy.
- A central courtyard with an operable glass roof and wall panels extends the living space and acts as a solar heat collector.
- The house demonstrates urban and ancestral Native American farming with a hydroponic garden, exterior vegetable garden, and movable living walls.
- A barrel composter turns food scraps into nutrients, and a composting toilet processes human waste.
- A solar electric PV array with battery storage; rainwater and greywater collection and treatment systems; and a composting toilet allow the house to operate independently.
- Designed with influences from the Nanticoke Indian Tribe, the house incorporates materials that consider tribal environmental ethics.

Team online presence:

Website: http://2017.solarteam.org/
FB: https://www.facebook.com/UMDSD2017/?hc_ref=SEARCH
Twitter: https://twitter.com/umd_sd2017
Instagram: https://www.instagram.com/umdsd2017/

Past houses:

https://www.solardecathlon.gov/past/2011/team_maryland.html
https://www.solardecathlon.gov/past/2007/team_maryland.html
https://www.solardecathlon.gov/past/2005/team_maryland.html
https://www.solardecathlon.gov/past/2002/team_maryland.html

Missouri S&T: Missouri University of Science and Technology (Rolla, Missouri)

The team from the Missouri University of Science and Technology combined traditional farmhouse architecture with state-of-the-art sustainable technologies when designing *SILO*, their entry in Solar Decathlon 2017. *S* is for Smart, as in a house that lets occupants control all of its systems using voice commands. *I* is for Innovative, as in a student-designed system that monitors the house's interior environment. *L* is for Living, and speaks to a farmhouse-inspired lifestyle that encourages gathering and sharing food. And *O* stands for Oasis, a serene space filled with natural light, fresh air, and greenery—a place where empty-nesters can relax, rejuvenate, and congratulate themselves on a job well done.

Target homeowner: Empty nesters in their late 40s to early 50s.

Technological innovations and unique features:

- The farmhouse-style house emphasizes quality of life with an open floorplan, abundant daylighting, fresh air, greenery, and places to gather.
- Smart home automation systems allow occupants to receive feedback on energy use and to use voice commands to control lighting, thermostat, windows, and more.
- A clay plaster (researched by a Missouri S&T professor) made in part with recycled materials serves as a wall paint alternative for its air cleaning and humidity regulating benefits.
- A greywater system utilizes an architecturally pleasing water wall to aerate used water from sinks and showers; the treated water irrigates non-edible landscaping and a movable green wall.
- Home automation systems optimize energy efficiency and ensure the seamless integration of devices, as a combination of physical and wireless networks track, automate and maintain lighting, windows, fans, HVAC, and battery storage.
- The residential energy storage system uses an 8.5 kW solar array in tandem with six storage batteries with internal microinverters, and it can be monitored and controlled via a smart device.

Team online presence:
Website: http://solarhouse.mst.edu/
FB: https://www.facebook.com/MSTSolarHouse/
Twitter: https://twitter.com/MSTSolarHouse

Past houses:
https://www.solardecathlon.gov/2015/competition-team-missouri-st.html
https://www.solardecathlon.gov/past/2013/team_missouri.html
https://www.solardecathlon.gov/past/2009/team_missouri.html

https://www.solardecathlon.gov/past/2007/team_rolla.html
https://www.solardecathlon.gov/past/2005/team_rolla.html
https://www.solardecathlon.gov/past/2002/team_rolla.html

Netherlands: HU University of Applied Science Utrecht (Utrecht, Netherlands)

The Solar Decathlon 2017 team from the Netherlands has developed the design of their modular, eco-friendly materials around the concept a fairly well known toy: LEGO. Using the wall panels as "blocks," homeowners can tailor a house to fit their needs, whether they need to scale up or down. On top of the modular house design, the Netherlands team has connected the entire house to the burgeoning "Internet of Things" industry by connecting heat, water, and other utilities to the owner's smartphone, so the owner can easily monitor and regulate settings from anywhere.

Target homeowner: "Doorstromers" a term describing a person in a transition stage of life, in this case a stage where they are looking to start a family and might need more space soon.

Unique features:

- Movable, modular walls allowing for customization and expansion.
- Schneider Electric smart battery system
- Domotica home automation system

Team online presence:
Website: http://www.selficient.nl/
FB: https://www.facebook.com/SelficientNL/
Twitter: https://twitter.com/Selficient17
Instagram: https://www.instagram.com/selficient17/

Northwestern: Northwestern University (Evanston, Illinois)

To help guide their design for a flexible, appealing house marketed for Chicago's baby boomers, the student team from Northwestern University conducted extensive user research within their local community to create hypothetical clients: a couple named Michael and Lisa. Knowing that Michael and Lisa value aesthetics and functionality above all, the students wove energy efficiency and sustainability into their modern, sophisticated aesthetic, which they call *Enable*. Constructed with structural insulated panels (SIPs), *Enable* also includes roof-integrated solar panels, movable interior walls, and an attached sunroom. And, to help Lisa and Michael maintain their good health as they age, the students added air-filtering technologies and a system that monitors VOCs, CO_2, dust, and humidity.

Target homeowner: *Enable* was designed for baby boomers residing in Chicago's North Shore.

Technological innovations and unique features:

- The modern-style *Enable* integrates energy efficiency and sustainability into practical, sophisticated, and clean design features that appeal to aging baby boomers.
- Modular interior walls, made from recycled MDF fitted into aluminum frames, are easily reconfigured to accommodate occupants' changing needs.
- Contributing to the house's clean lines, roof-integrated solar PV panels are efficient, affordable, and easy to install and replace.

- A comprehensive approach to maintaining indoor air quality includes an energy recovery ventilation system, a photocatalytic surface treatment that breaks down airborne pollutants and improves air quality, an air quality monitoring system, and indoor house plants carefully selected for their ability to help purify the air.

Team online presence:
Website: http://www.northwestern.house/
FB: https://www.facebook.com/HouseByNorthwestern/
Twitter: https://twitter.com/housebyNU
Instagram: https://www.instagram.com/housebynu/

Swiss Team: École Polytechnique Fédérale de Lausanne, School of Engineering and Architecture Fribourg, Geneva University of Art and Design, and the University of Fribourg (Lausanne, Switzerland)

The Swiss Team's Solar Decathlon 2017 project *NeighborHub* aims to create community spirit by offering a place dedicated to learning and exchanging ideas to create a more sustainable future. The house can be used as a workspace, a conference room, a community dining space, a local market, or a gardening area, as well as provide functional living and sleeping space. *NeighborHub's* multipurpose spaces are arranged in a layered configuration connected by wide openings to ensure good airflow. The team intends 100% of the house's exterior walls to be used for energy production. Solar panels are integrated on the east, south, and west façades of the building to harvest maximum energy, while the roof is used for water collection and as green space.

Target homeowner: Rather than being a traditional home, NeighborHub is intended to be a community space in a suburban neighborhood.

Technological innovations and unique features:

- Intended as a collaborative space for a community to discuss issues of energy and sustainability, and to provide a space for community activities such as cooking meals and hosting workshops
- In addition to a photovoltaic (solar electric) system, the team is also using dye-sensitized "Gratzel" solar cells to generate electricity and team-built solar thermal panels for hot water and space heating
- A dry toilet that uses worms to recycle waste
- A green roof with vegetation on every surface of the roof skin—plants were chosen to attract bees
- Two vertical greenhouses, one with aquaponics to breed fish.

Team online presence:
Website: http://www.swiss-living-challenge.ch/en/
FB: https://www.facebook.com/association.solar/
YouTube: https://www.youtube.com/channel/UCIOJzvjet3LD_UWvXtvhZmA

Team Alabama: University of Alabama at Birmingham and Calhoun Community College (Birmingham, Alabama)

The Solar Decathlon 2017 Team Alabama's *surviv(AL) House* embodies the irrepressible spirit of Southern communities that have pioneered, adapted, survived, and rebuilt. Inspired by the devastating impact of the 2011 tornado super outbreak on the region, *surviv(AL) House* is intended to serve as a model for sustainable, resilient housing for severe weather-prone communities. The house offers "quick permanence," a term the team uses to describe a house that can be quickly rebuilt to provide comfort, security, and energy independence in the aftermath of a disaster.

Target homeowner: This house is designed for any mid-sized family or group of people who want protection from tornados and heat while living in the state of Alabama. It was inspired by the 2011 Alabama tornado outbreaks and the high instance of tornados in the state.

Technological innovations and unique features:

- A safe room with tornado panels made to FEMA standards to withstand 250-mph winds. Even if a storm destroys the house, the room will remain intact and keep occupants safe
- Designed with "quick permanence" in mind, meaning that contractors could easily rebuild in the event of a storm
- Inspired by the southern vernacular architecture tradition, which helped with cooling before the advent of air conditioning through cross ventilation and shaded porches and canopies
- A liquid desiccant system and solar collector dehumidify air
- A robotic cooler can be summoned with a remote to provide localized cooling so that central heating can be more energy efficient.

Team online presence:
Website: http://www.uab.edu/solardecathlon/
FB: https://www.facebook.com/UABsolardecathlon/
Instagram: https://www.instagram.com/uabsd17

Team Daytona Beach: Embry-Riddle Aeronautical University and Daytona State College (Daytona Beach, Florida)

Consider this: The oldest "Gen X-ers" will be turning 52 in 2017. That's right, Generation X is rapidly approaching their retirement years, and Solar Decathlon 2017 Team Daytona Beach intends to create a sustainable house designed with retirees in mind, from Americans with Disabilities (ADA) compliant features to a ductless HVAC system designed

to keep Florida homes cool using a fraction of the energy. The design also features a hydroponic garden that uses collected rainwater to grow leafy vegetables and herbs, without impacting Florida's water systems. The team designed "The BEACH House" with inspiration from Ernest Hemingway's historical home in Key West by incorporating colors and art deco details into the sustainable house design.

Target homeowner: Empty-nesters residing in Central Florida

Technological innovations and unique features:

- Inspired by Ernest Hemingway's 1930's home
- Hydroponic garden with an air-lift system to move water

Team online presence:
Website: http://teamdaytonabeach.com/
FB: https://www.facebook.com/TeamDaytonaBeach/
Twitter: https://twitter.com/teamdb2017
Instagram: https://www.instagram.com/teamdaytonabeach2017/

UC Berkeley/U of Denver: University of California at Berkeley and University of Denver (Berkeley, California and Denver, Colorado)

The UC Berkeley and University of Denver team designed the *RISE* house specifically for the city of Richmond, California, to support its transition from a city with traditionally suburban neighborhoods to a transit- and community-oriented urban community. Although you'll see a single-family unit at Solar Decathlon, ultimately *RISE* can, well, rise—up to three stories with five units of multifamily living. The design focuses on practicality and efficiency, resulting in a flexible floor plan with moveable walls and windows that allow ample light into the interior, and roof space for outdoor living. It is also designed to be ultra energy efficient, to recycle greywater, and use innovative materials to improve air quality.

Target homeowner: The house is designed for low-income families affected by high housing costs in Richmond, California, which is transitioning from a city with traditionally suburban neighborhoods to a transit- and community-oriented urban community.

Technological innovations and unique features:

- The defining feature of *RISE* is its stacking capability; three units will be able to be stacked for high-density, sustainable, urban expansion. Only one unit will be at the competition, but the team will highlight the full concept in a variety of ways.
- Two eye-catching façades: *RISE* house's south, east, and west facades have a distinctive wave pattern formed by a crafted wooden exterior.
- The north façade is a green wall of moss that works to sequester carbon and clean the air.
- Movable walls on tracks that allow for flexible bedroom and living room spaces.
- Kitchen counters and tile made from recycled ceramic materials.
- Wool insulation.

Team online presence:
Website: https://solardecathlon.berkeley.edu/
FB: https://www.facebook.com/RISE2017SolarDecathlon/
Twitter: https://twitter.com/SolarDatUCB
Instagram: https://www.instagram.com/risesolardecathlon/

UC Davis: University of California, Davis (Davis, California)

In addition to being ultra energy efficient, OUR H_2OUSE (pronounced "Our House") was designed by the University of California, Davis team to dramatically reduce potable water usage. The design is a direct response to the terrible drought that gripped California in recent years and will help residents better prepare for inevitable drought in the future. OUR H_2OUSE supplements water and energy-efficient technologies with feedback displays

to help occupants improve their own end-use behavior. The feedback also compares usage in OUR H_2OUSE to its larger community, thereby proposing a paradigm shift, in which sustained resource conservation is the shared goal of the house, its occupants, and the surrounding community.

Target homeowner: This house is designed for those living in the drought-prone state of California. It's an adaptable space that can accommodate a couple, a four-person family, or group of student renters.

Technological innovations and unique features:

- The primary inspiration for OUR H_2OUSE was the serious drought taking place in California when the team formed—the team's primary focus is water conservation; the house is designed to use 50% less potable water than a typical residence.
- Visual and physical feedback on energy and water use employs recognizable units and uses community-scale information sharing to raise occupant awareness and tap into potential collaboration or competition with other houses/neighbors.
- A building envelope constructed from a 12" thick, bamboo-based, panelized exterior wall system and oriented strand board/extruded polystyrene foam OSB/XPS structural insulated panels (SIPs) results in the house having a fraction of the carbon footprint of a standard residence.

Team online presence:
Website: http://solardecathlon.ucdavis.edu/
FB: https://www.facebook.com/ucdavis.solardecathlon.2017/
Twitter: https://twitter.com/ucdavis_sd2017

Past Houses:
https://www.solardecathlon.gov/2015/competition-team-uc-davis.html

Wash U St. Louis: Washington University (St. Louis, Missouri)

With *Crete House*, the Solar Decathlon 2017 team from Washington University in St. Louis wants to send a message that concrete can be a viable, sustainable—and beautiful—alternative to light wood-frame construction. The students designed their house with precast insulated panels that are manufactured in a factory and assembled on-site. Large gutters extend out from the main concrete structure and offer support for shading materials while creating outdoor living space. The gutters also collect and direct rainwater and serve as vertical planters. This hydroponic system is part of a productive landscape that should enable the occupants to grow food all year round. Durable, stormproof, and fire-resistant, the students believe Crete house will still be standing a century from now.

Target homeowner: *Crete House* was designed for two research scientists stationed at Washington University's Tyson Research Center in Eureka, Missouri.

Technological innovations and unique features:

- The team developed a precast concrete sandwich panel for the exterior walls, consisting of four inches of standard concrete, five inches of insulation, and one inch of "Ultra-High-Performance-Concrete," or UHPC.
- *Crete* is designed for resilience, protecting against fire, moisture and mold, insects, seismic events, and extreme weather conditions,
- The hydroponic growing system consists of vegetated channels, modular vertical and horizontal ground planters watered with drip emitters.
- A water-to-water heat pump provides both domestic hot water and chilled and hot water for the radiant system.
- Radiant heating and cooling system in floor and ceiling.

Team online presence:
Website: solardecathlon.wustl.edu
FB: facebook.com/WashUSolarDecathlon/
Instagram: Instagram.com/washusolardecathlon

WITHDRAWN: Washington State: Washington State University (Pullman, Washington)

In September 2017, just before they were ready to transport their competition house to the event, the team from Washington State University withdrew from the competition. Although the team was not able to finish construction and bring its solar-powered house to Denver, they fully met all the other rigorous competition requirements through multiple deliverable submissions.

The Solar Decathlon organizers appreciate all the hard work the students on the Washington State University team did to just design not just a single house, but an entire sustainable community. Responding to a regional housing crunch and taking cues from the "tiny house" movement, the team's EnCity project is designed as a "pocket" community for urban infill lots. The community of tiny homes shares infrastructure, including a microgrid that manages collected solar energy and rainwater and distributes these resources among the residents. The tiny homes are constructed using cross-laminated timbers that have been treated with shou sugi ban, a traditional Japanese technique that renders the wood resistant to insects and fire. The decks are made of composite decking boards made from recycled wind turbine blades

Target Homeowner: This series of tiny homes are designed for urban infill lots creating "pocket neighborhoods" in Seattle and Spokane, Washington. The team envisions separate families living in each home, but the households would utilize community space together.

Technological innovations and unique features:

- Rather than designing a single home, the team designed a series of tiny homes along with a communal clubhouse.
- The Japanese technique called shou sugi ban was used on the exterior of the home. This involves charring the wood and applying oil, which helps the cladding resist insects and fire.
- The team uses a four-step filtration and disinfection process to treat both collected rainwater and greywater that meets Washington State's strict standards for water reuse.
- The Washington State team designed a "flat pack" system for ease of assembly and transport of the tiny homes.
- To maximize the amount of time open windows can be used to provide cooling and ventilation, the mechanical windows are programed to retrieve weather data and sense air pressure, and open and close according to the conditions.
- The deck is made out of composite decking materials fabricated from recycled wind turbine blades.

Team online presence:
Website: https://solardec.wsu.edu/
FB: https://www.facebook.com/wsusolardec/
Twitter: https://twitter.com/wsusolardec2017
Google+: https://plus.google.com/104831377438709704030

Past houses: https://www.solardecathlon.gov/past/2005/team_washington.html

Sponsors

The U.S. Department of Energy Solar Decathlon 2017 depends on the generosity of sponsors to ensure the success of its event and the competing teams. Sponsoring organizations participate in the future of sustainable design and directly impact tomorrow's clean energy workforce.

Supporting Sponsors:

Wells Fargo
Wells Fargo is proud to be a supporting sponsor of the U.S. Department of Energy Solar Decathlon 2017. A diversified, community-based financial services company, Wells Fargo is committed to doing our part to accelerate the transition to a lower-carbon economy, to reduce the impacts of climate change, and to foster a culture of environmental stewardship in the communities where we live and work.

With nearly 100 million square feet of real estate under management, Wells Fargo is a recognized leader in operational efficiency, and we are on track to meet a number of ambitious sustainability goals, including major reductions in overall water use and greenhouse gas emissions across our footprint, and powering 100% of our global operations with renewable energy by the close of 2017. We are also a leader in financing clean technologies and renewable energy projects, having invested more than $70 billion in environmentally sustainable businesses since 2012. In 2016, projects owned in whole or in part by Wells Fargo produced more than 8% of all solar photovoltaic and wind energy generated in the United States.

We focus our environmental philanthropy on nurturing an ecosystem that helps innovative startup companies advance scalable clean technology solutions; supporting environmental education in our communities through STEM education and other programs; and partnering with local nonprofit organizations to engage our customers and communities in volunteer projects that will help them adapt to climate change, conserve resources, improve resource efficiency, reduce energy costs, and create jobs in the global “green economy.”

The Solar Decathlon is a venue for the next generation of sustainability leaders to come together and share their respective visions for a more sustainable future through innovation, technology, and design. We congratulate everyone involved with this one-of-a-

kind student competition, and we are grateful for their contributions to the health of our planet and the global clean-technology ecosystem.

City and County of Denver
As a supporting sponsor of the U.S. Department of Energy Solar Decathlon 2017, the City and County of Denver is energized to host this solar energy collegiate competition.

Enjoying hundreds of sunny days per year, Denver has one of the most solar-friendly climates in the country. Denver also has a long history of supporting renewable energy and energy efficiency programs. We have been nationally recognized for our efforts to reduce solar "soft costs," by streamlining solar permitting and offering reduced fees capped at $50 for solar permits. Most solar projects in Denver are able to get a permit in one day.

Wherever possible, we encourage builders to design and build sustainably. Since 2016, we have raised the bar for development in Denver by ensuring that all new construction meets international standards for energy conservation, which emphasize the design of energy-efficient buildings and the use of energy-efficient mechanical, lighting, and power systems.

We continue to consider ways we can promote greener construction in our city, from devising new incentives for net zero energy buildings to promoting the adaptive reuse of existing buildings.

Denver and Colorado have been leaders in sustainable living, as well as frontrunners in growing the clean energy economy. We're aggressively pursuing our goal of reducing emissions 80% by 2050. We will continue to act with our eyes on the future and support the creation of good-paying clean energy jobs. Solar Decathlon is a great way to showcase these jobs to our residents, not to mention the many sustainable and energy saving technologies on display in the competition houses and at the Sustainability Expo.

Denver International Airport
As a supporting sponsor, Denver International Airport (DEN) applauds the U.S. Department of Energy Solar Decathlon 2017 student competitors. Today's solar decathletes are the future leaders of the environmental sustainability principles to which DEN is committed.

With an anticipated 60 million plus passengers in 2017 and 189 destinations in 11 countries, DEN is the sixth-busiest airport in the world. DEN, with its long-held commitment to environmental stewardship, is also one of the highest solar-generating airports in the United States.

DEN's iconic tented Jeppesen Terminal was designed with sustainability in mind. The structure allows for daylight to enter, greatly decreasing the amount of energy needed to light the interior.

DEN's commitment to the environment doesn't stop with its initial design. The airport is quick to adopt new processes and technologies that can increase its energy efficiency. Control technology is anticipated to decrease the airport's heating and cooling by 8 million kilowatt hours (kWh) per year. In addition, DEN's lighting retrofit projects—which replace outdated lighting technology with new, energy-efficient LED technology—have saved more than 8.3 million kWh annually.

On DEN's expansive 53-square miles of real estate, we have five photovoltaic solar arrays designed to produce more than 19.5 million kWh of energy a year. That's enough to power 2,600 Denver-area homes. DEN is excited and proud to host Solar Decathlon 2017 on a site where we are partnering with Xcel Energy and Panasonic on a 1.6 MW solar photovoltaic installation covering the parking lot, which along with Panasonic's rooftop solar array, will power a battery system that will support a microgrid for the Peña Station NEXT Transit-Oriented Development site.

To create additional excitement for Solar Decathlon 2017, DEN is hosting a Sustainable BARKitecture Dog House competition, which challenges local architecture firms to compete in designing a solar dog house customized to one of the airport's own Canine Airport Therapy Squad (CATS) dogs.

Contributing Sponsors

L.C. Fulenwider
As the master developer of Peña Station NEXT, L.C. Fulenwider is excited to be a Contributing sponsor to the U.S. Department of Energy Solar Decathlon 2017. The Solar Decathlon's mission to build real world examples of the best in solar-powered living solutions is a perfect fit with our mission for Peña Station NEXT to become a real world test of "What's NEXT"?

Strategically located adjacent to Denver International Airport, Peña Station NEXT has been designed with an emphasis on energy-efficient offices, hotels, retail, multifamily, entertainment, and wellness facilities. This master-planned, mixed-use development is bordered on the west by permanent open space and is inspired by the demands of what's next: a self-sufficient community that embraces smart technology, community, clean

energy, and mobility. Peña Station Next is further enhanced by ensuring views of the Rocky Mountains to remind residents that while this may be the West, it's the New West.

Schneider Electric
Schneider Electric is proud to continue its Contributing sponsor support of the U.S. Department of Energy Solar Decathlon 2017. Since 2009. Schneider Electric has designed the electrical connection between the Solar Decathlon village and the utility service to enable a safe and reliable microgrid solution. Schneider is also committed to communities where we live and work, and therefore, is also providing at least 50 employee volunteers to staff the event.

Since 2010, Schneider Electric has also sponsored four international Solar Decathlon competitions, including, most recently, the Solar Decathlon Latin America and Caribbean competition held in 2015.

At Schneider Electric, we have a saying that everything we do is based on a core belief that energy is the base of life. As a global specialist in energy management and automation, our 144,000 plus employees serve customers in more than 100 countries, helping them to manage their energy and process in ways that are safe, reliable, efficient, and sustainable. From the simplest of switches to complex operational systems, our technology, software, and services improve the way our customers manage and automate their operations. Our connected technologies reshape industries, transform cities, and enrich lives. At Schneider Electric, we call this Life Is On.

Regional Transportation District
The Regional Transportation District (RTD) is a proud Contributing sponsor of the U.S. Department of Energy Solar Decathlon 2017 in Denver, Colorado. As a sustainable, eco-friendly form of transportation, RTD is committed to preserving our natural resources, and we believe every effort should be made to use clean fuels, reduce emissions, recycle, and always look for ways to reduce our impact on the environment. Public transportation promotes healthy mobility habits, which create healthier cities, cleaner air, and better access to education, jobs, health care, and other goods and services. RTD is a proud recipient of LEED Gold certification on the building of Union Station and our Commuter Rail Maintenance Facility.

Xcel Energy
Xcel Energy is proud to be a Contributing sponsor of the U.S. Department of Energy Solar Decathlon 2017 and the competition's host utility sponsor.

Headquartered in Minneapolis, Minnesota, every day Xcel Energy powers millions of homes and businesses across eight Western and Midwestern states. Our customers can count on us 24/7 to be there with safe, reliable, and affordable electric and natural gas service.

Xcel Energy's sponsorship provides much of the Solar Decathlon's infrastructure, furnishings, and temporary electrical service interconnection, providing the solar village access to the utility grid.

Also on the event site, visitors can see Xcel Energy's, Panasonic's, and Denver International Airport's microgrid battery pilot project. For Xcel Energy, this project tests the application of battery technologies that can help integrate renewable energy into the grid, provides backup power to Panasonic during an outage, and helps determine how we might offer future battery services to customers.

Xcel Energy is a recognized industry leader in delivering renewable energy and in reducing carbon emissions. We have steadily transformed how we produce, deliver, and encourage the efficient use of energy, all at a low cost to customers.

Panasonic Enterprise Solutions

Panasonic Enterprise Solutions Company is a proud Contributing sponsor to the U.S. Department of Energy Solar Decathlon 2017. Based out of Peña Station NEXT, which is home to Solar Decathlon 2017, Panasonic Enterprise Solutions is a wholly-owned business unit of Panasonic Corporation of North America, based in Newark, New Jersey. Panasonic is a leading technology partner and integrator to businesses, government agencies, and consumers across the region. The company is the principal North American subsidiary of Panasonic Corporation, based in of Osaka, Japan, and the hub of Panasonic's U.S. branding, marketing, sales, service, and R&D operations.

Panasonic was featured in Fortune Magazine's 2016 ranking of 50 companies that are changing the world and doing well by doing good. Specifically cited were its smart and sustainable technologies, including its contributions to smart cities and the electric vehicle revolution. Denver-based Panasonic Enterprise Solutions Company includes CityNOW, Panasonic's North American smart city initiative, which includes a focus on smart energy solutions with clean, resilient renewable energy.

Resource Sponsors

Beko

Beko is pleased to join the distinguished list of U.S. Department of Energy Solar Decathlon 2017 Resource sponsors.

Beko U.S., Inc. is a subsidiary of Arçelik A.S. whose vision is, "Respects the globe, Respected globally." In June 2016, Beko secured a place in the United States. A sister brand, Blomberg, has been a top choice in premium developments across North America since 2008. In 2017, Beko received the Environmental Protection Agency's ENERGY STAR® Partner of the Year for its outstanding contributions to protecting the environment through energy efficiency.

Center for Science Teaching and Learning
The Center for Science Teaching and Learning loves to support the U.S. Department of Energy Solar Decathlon 2017! To us, the Solar Decathlon demonstrates how people should learn. By designing and innovating, the student teams have learned so much about renewable energy, sustainability, and more. And, because this competition is open to the public, all the visitors get to learn in a way that is engaging and exciting too.

Westin Denver International Airport
The Westin Denver International Airport is proud to be a Resource sponsor of the U.S. Department of Energy Solar Decathlon 2017. The hotel is designed to create a dynamic, urban experience. With 519 soundproof guest rooms featuring panoramic views of downtown, the Rocky Mountains and the airfield, enjoy all the comforts of Westin with our world-class amenities. The hotel has received Platinum status under the ®LEED program. This prestigious designation makes The Westin Denver International Airport the highest LEED-rated hotel at any major U.S. airport.

American Solar Energy Society
The American Solar Energy Society (ASES) is a proud Resource sponsor of the U.S. Department of Energy Solar Decathlon 2017. Established in 1954, ASES is a non-profit organization that advocates for sustainable living and 100% renewable energy. We share information, events, and resources to cultivate community and power progress in the United States and beyond. ASES 46th annual conference, SOLAR 2017, occurs October 9—12, 2017, in conjunction with the Solar Decathlon in Denver. ASES is proud to partner with Solar Decathlon by presenting a series of Solar 101 Consumer Workshops.

Modern in Denver
Modern In Denver is pleased to be a Resource sponsor of the U.S. Department of Energy Solar Decathlon 2017. Modern In Denver Magazine is The Rocky Mountain Region's Design Authority, reaching both the creative community and the design enthusiast. For more than nine years Modern In Denver has been uniquely focused on telling authentic stories, fostering thoughtful and purpose driven dialogue, and creating meaningful and unexpected

focus. Our aim is to be instrumental in growing, understanding, and building interest in good design throughout the Rocky Mountain region.

RSMeans
RSMeans data is a proud Resource sponsor of the U.S. Department of Energy Solar Decathlon 2017. RSMeans provided the Solar Decathlon 2017 teams with access to the RSMeans Data Online cost-estimating tool, allowing them access to local and accurate cost data.

Association Sponsors

The U.S. Department of Energy Solar Decathlon 2017 appreciates the generous contributions of our Association sponsors.

Denver Water
Denver Water supports the goals of Solar Decathlon 2017 to train, educate, and demonstrate sustainable living and workforce solutions.

D+R International
For more than a decade, D+R International has led the Solar Decathlon's Education Days program, showcasing our dedication to advancing energy efficiency for the nation and future generations.

Solar Novus Today
Solar Novus Today, a leading trade publication serving the solar industry, proudly supports Solar Decathlon 2017—the premiere showcase of solar energy's great potential.

9 News
9NEWS is home in Colorado, the state with 300 days of sunshine. We embrace innovation that supports and celebrates our community.

CH2M
CH2M is dedicated to creating pathways for human progress by tackling challenges that make a positive difference for our clients and communities.

Confluence Communications
Confluence Communications proudly supports Solar Decathlon 2017 by providing extensive in-kind strategic communications services. Solar Decathlon aligns with our company's mission to support the advancement of programs that create sustainable solutions for our people, place, and planet.

MicroPlanet
Since 2011, MicroPlanet's low voltage regulators have allowed energy produced by photovoltaic (PV) solar electricity and wind energy to be integrated into the Solar Decathlon village microgrid.

OxBlue
OxBlue is a leading provider of time-lapse construction camera services. As a proud sponsor, OxBlue is providing time-lapse images and live stream video services directly from the Solar Decathlon 2017 village.

Thrive Home Builders
Thrive Home Builders, a leader in the design and construction of energy-efficient homes for more than two decades, is proud to support the innovation and leadership promoted by Solar Decathlon 2017.

Visit Denver
Sustainability is an essential part of Denver's brand. As the official marketing arm of the city, VISIT DENVER helps Solar Decathlon 2017 with marketing, advertising, and public relations support.

WAC Lighting

WAC Lighting is a proud sponsor of Education Days at Solar Decathlon 2017. WAC provides products that are progressive in both design and technology with groundbreaking LED innovations.

ASHRAE
A proud sponsor since 2005, ASHRAE contributes to the Solar Decathlon to support students in their effort to shape tomorrow's built environment today.

Affiliate Sponsors

The U.S. Department of Energy Solar Decathlon 2017 extends a special thanks to its Affiliate sponsors:

Danby Products Incorporated is awarding compact refrigerators and microwaves to prize-winning educators at the Education Days.

National Association of Home Builders is honored to sponsor the Victory Breakfast for the Solar Decathlon competitors and to share its commitment to building high-performance homes and encouraging careers in residential construction.

Exelon is donating the time and expertise of several employees who will provide valuable support to the Solar Decathlon competition management team.

WeWork, where Denver's entrepreneurial spirit thrives, is offering decathletes complimentary access to its dynamic and inspirational workspaces.

Friends and Regional Stakeholders
The U.S. Department of Energy Solar Decathlon 2017 extends a special thanks to the following friends and regional stakeholders:

Friends of the Solar Decathlon

Liberty Mutual Insurance is contributing generous financial support for the advancement of smart energy production through design excellence.
National Children's Theater Group is providing free performances of *The Resource Force*.
Nolan Financial Group is contributing generous financial support to the Solar Decathlon.
Peet's Coffee is supplying complimentary, freshly brewed coffee to energize the solar decathletes during assembly of the Solar Decathlon village.
The Solar Training Network is sponsoring, planning, and delivering the Solar Decathlon Career Fair.
Solar Energy International is working in tandem with the Solar Training Network to produce the Solar Decathlon Career Fair.
Viva Green Homes is generously promoting Solar Decathlon 2017 across its media platforms and connecting Solar Decathlon 2017 with Viva Green partners and industry leaders.
Willis Towers Watson is contributing generous financial support to the Solar Decathlon.
EnergyLogic is donating time and energy to conduct complimentary blower door tests on the Solar Decathlon 2017 competition houses for the Health and Comfort contest.
Vaisala is supplying Solar Decathlon 2017 organizers with carbon dioxide sensors at a generous discount.
REED Instruments is supplying light meters at a generous discount to the Solar Decathlon

2017 organizers.
The National Electrical Manufacturers Association is providing editorial coverage of the Solar Decathlon in their magazine, *electroindustry*.

Regional Stakeholders

American Institute of Architects
American Lung Association
Big Brothers, Big Sisters of Colorado
Boulder Valley School District
Building Codes Assistance Project at The Trust for Conservation Innovation
Children's Museum of Denver
Colorado Renewable Energy Society (CRES)
Colorado School of Mines
Colorado Solar Energy Industries Association (COSEIA)
Councilwoman Stacie Gilmore's Office
Denver Public Schools
Denver Regional Council of Governments
Domino Strategies
Optic Nerve
University of Denver

The Solar Decathlon Organizers also extend a special thanks to the **State of Colorado, Governor John Hickenlooper**, and **the Colorado Energy Office** for their continued to support in bringing Solar Decathlon 2017 to Colorado.